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(54) **SELECTION SYSTEM, SELECTION SERVER, SELECTION METHOD, AND COMPUTER READABLE MEDIUM**

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(57) **ABSTRACT**

A selection system includes an acquiring unit, a candidate selecting unit, and a product selecting unit. The acquiring unit acquires device information of multiple devices. The candidate selecting unit selects, from among the multiple devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced. The product selecting unit selects, based on a selection result by the candidate selecting unit and product information regarding multiple products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

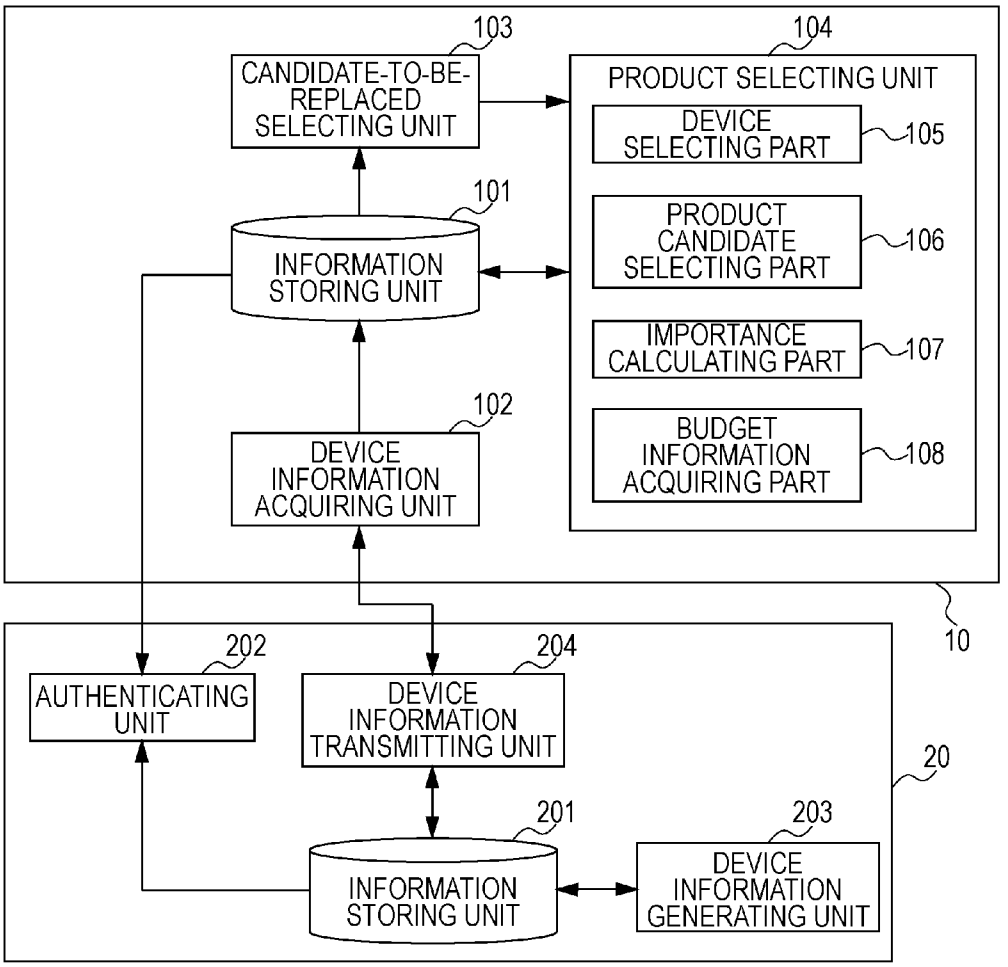


FIG. 1

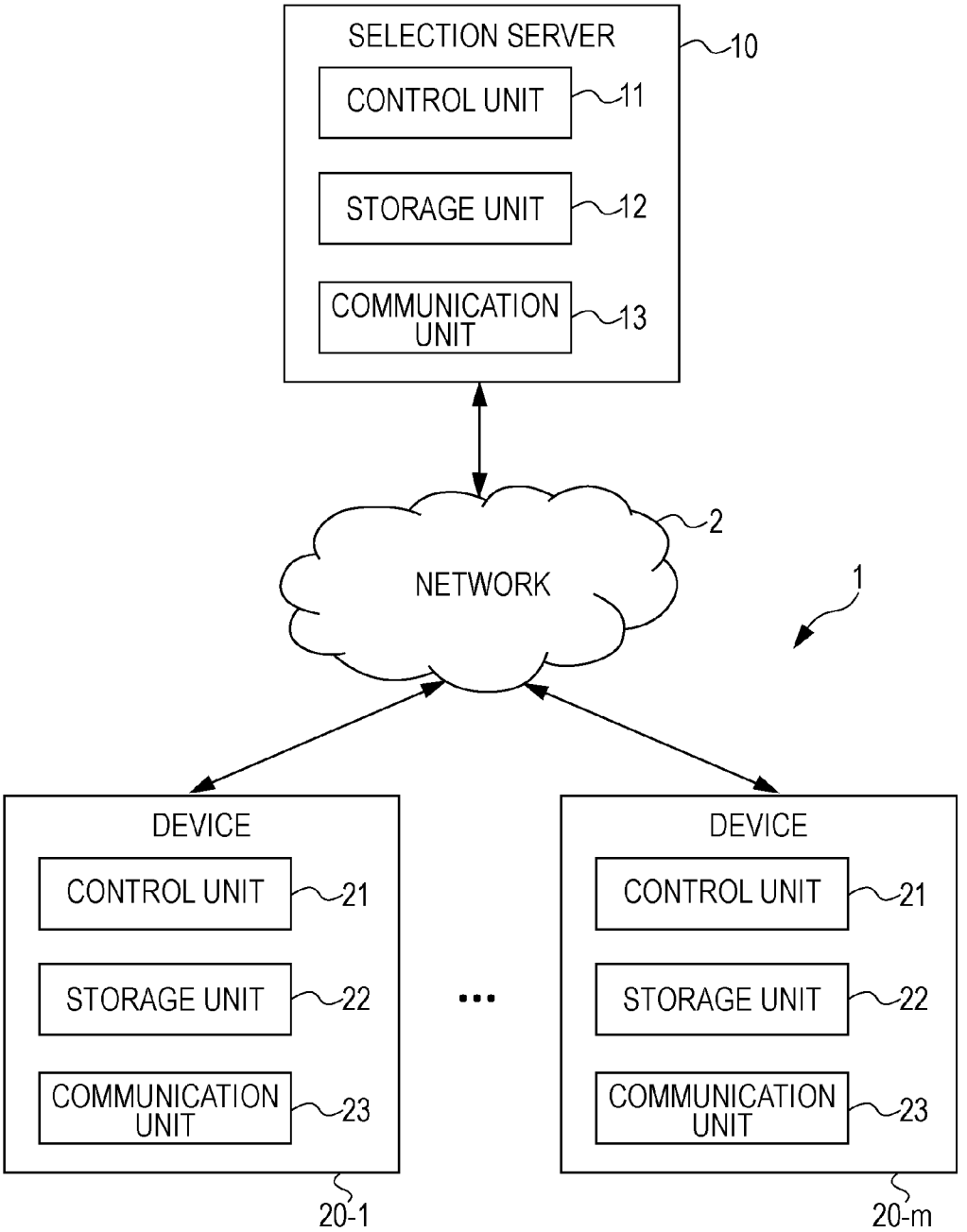

SELECTION SERVER
10
CONTROL UNIT
11
STORAGE UNIT
12
COMMUNICATION UNIT
13
NETWORK
2
1
DEVICE
CONTROL UNIT
21
STORAGE UNIT
22
COMMUNICATION UNIT
23
20-1
DEVICE
CONTROL UNIT
21
STORAGE UNIT
22
COMMUNICATION UNIT
23
20-m

FIG. 2

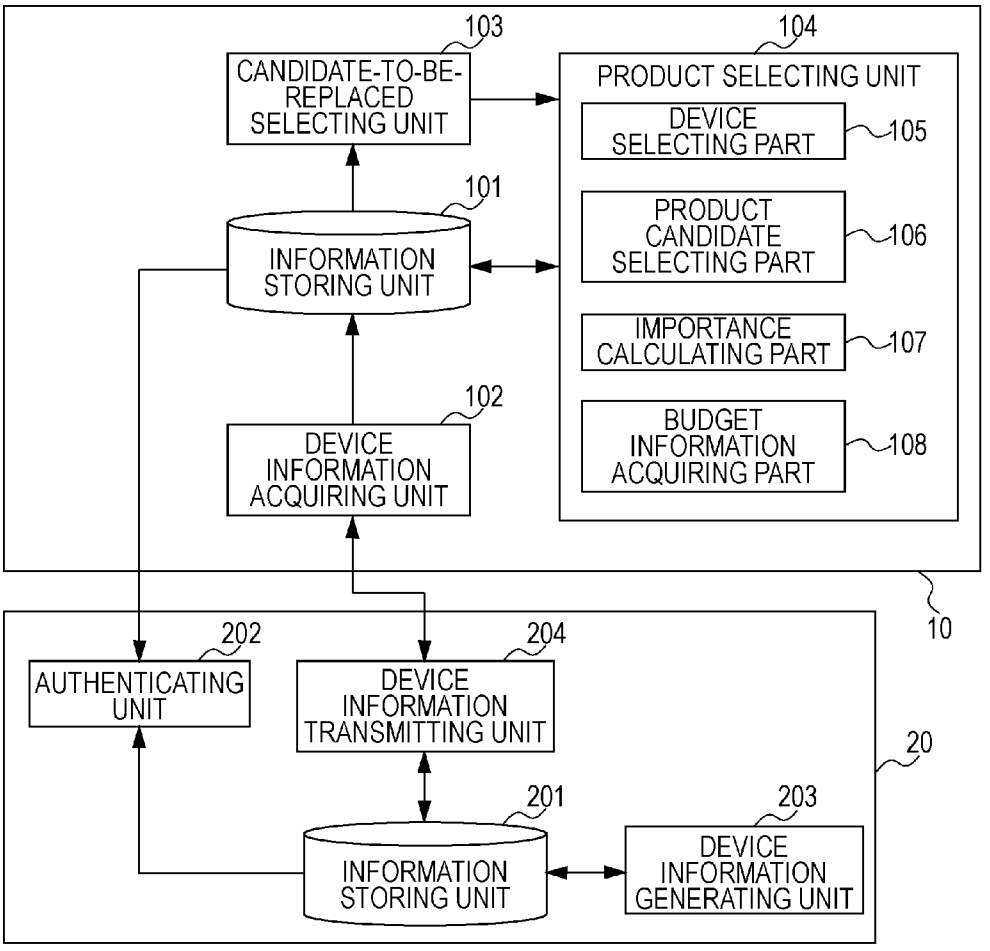

103
CANDIDATE-TO-BE-REPLACED SELECTING UNIT
104
PRODUCT SELECTING UNIT
DEVICE SELECTING PART
105
101
INFORMATION STORING UNIT
PRODUCT CANDIDATE SELECTING PART
106
IMPORTANCE CALCULATING PART
107
102
DEVICE INFORMATION ACQUIRING UNIT
BUDGET INFORMATION ACQUIRING PART
108
10
202
AUTHENTICATING UNIT
204
DEVICE INFORMATION TRANSMITTING UNIT
20
201
203
INFORMATION STORING UNIT
DEVICE INFORMATION GENERATING UNIT

FIG. 3

LICENSE CODE	GROUP NAME	GROUP TYPE	GROUP SIZE (NUMBER OF WORKERS)	BUDGET
001	COMPANY A	PRECISION MACHINERY INDUSTRY	100	150,000 YEN
002	COMPANY B	PRECISION MACHINERY INDUSTRY	101	200,000 YEN
003	COMPANY C	PUBLISHING INDUSTRY	30	50,000 YEN

FIG. 4

LICENSE CODE	DEVICE NAME	TYPE	CPU NAME	MEMORY CAPACITY	HDD CAPACITY
001	PC-01	PC	CPU-B	2048 MB	250 GB
001	PC-02	PC	CPU-A	2048 MB	250 GB
001	PC-03	PC	CPU-B	1024 MB	250 GB
001	PC-04	PC	CPU-B	1024 MB	120 GB
001	Server-01	SERVER	CPU-C	2048 MB	500 GB
001	Server-02	SERVER	CPU-C	1024 MB	250 GB
002	Server-03	SERVER	CPU-D	4096 MB	500 GB

CPU USAGE (DAILY AVERAGE)	MEMORY USAGE (DAILY AVERAGE)	HDD USAGE	BIOS DATE	OS	SOFTWARE
5%	30%	20%	1/1/2009	OS-A (6.1)	AAA, BBB, CCC (2.1), (3.2), (1.2)
55%	60%	40%	1/1/2006	OS-A (6.1)	AAA, BBB (2.1), (3.0)
30%	90%	50%	1/1/2006	OS-A (6.1)	AAA, BBB, CCC (2.0), (3.0), (1.2)
20%	80%	90%	1/1/2006	OS-A (6.1)	AAA, BBB (1.3), (3.0)
10%	40%	20%	2/1/2007	OS-B (7.0)	DDD, EEE (0.9), (1.1)
35%	50%	60%	2/1/2003	OS-B (7.0)	DDD, EEE, FFF (0.9), (1.1), (1.0)
5%	30%	30%	2/1/2010	OS-B (7.0)	EEE, FFF (1.1), (1.0)

PRINCIPAL PROCESS	TRANSMISSION NETWORK TRAFFIC AMOUNT (DAILY AVERAGE)	RECEPTION NETWORK TRAFFIC AMOUNT (DAILY AVERAGE)	NUMBER OF CONNECTED DEVICES	NUMBER OF FILES HELD	...
AAA	10 MB	70 MB	6	1500	
AAA	10 MB	60 MB	5	3000	
AAA	20 MB	80 MB	6	3500	
AAA	10 MB	50 MB	4	3200	
DDD	50 MB	120 MB	10	4800	
EEE	60 MB	130 MB	10	4500	
EEE	50 MB	130 MB	10	5200	

FIG. 5

DEVICE NAME	CANDIDATE TO BE REPLACED		REPLACEMENT PRODUCT		IMPORTANCE
	DETAILS OF REPLACEMENT	INFORMATION OF COMPONENT	PRODUCT NAME	PRICE	
PC-02	CPU REPLACEMENT	CPU-A			
PC-03	MEMORY REPLACEMENT	1024 MB			
PC-04	MEMORY REPLACEMENT	1024 MB			
PC-04	HDD REPLACEMENT	128 GB			
PC-04	SOFTWARE UPDATE	AAA			
Server-02	BODY REPLACEMENT				

FIG. 6

PRODUCT TYPE	PRODUCT NAME	PRODUCT DETAILS	PRICE
CPU	CPU-A		20,000 YEN
	CPU-B		30,000 YEN
	CPU-C		40,000 YEN
	CPU-D		70,000 YEN
	•••		
MEMORY	MEMORY-A	1024 MB	5,000 YEN
	MEMORY-B	2048 MB	10,000 YEN
	MEMORY-C	4096 MB	22,000 YEN
	•••		
HDD	HDD-A	120 GB	5,000 YEN
	HDD-B	250 GB	8,000 YEN
	HDD-C	500 GB	15,000 YEN
	HDD-D	1 TB	20,000 YEN
	•••		
SOFTWARE	AAA		3,000 YEN
	BBB		0 YEN
	CCC		1,500 YEN
	•••		

FIG. 7

PRODUCT TYPE	PRODUCT NAME	PRODUCT DETAILS				PRICE
		BIOS DATE	CPU	MEMORY CAPACITY	HDD CAPACITY	
PC	PC-A	1/1/2009	CPU-B	1024 MB	120 GB	70,000 YEN
	PC-B	1/1/2011	CPU-B	2048 MB	250 GB	90,000 YEN
SERVER	Server-A	1/1/2009	CPU-C	1024 MB	250 GB	100,000 YEN
	Server-B	1/1/2011	CPU-C	2048 MB	500 GB	130,000 YEN
	Server-C	1/1/2012	CPU-D	4096 MB	1 TB	170,000 YEN

FIG. 8

DEVICE NAME	CANDIDATE TO BE REPLACED		REPLACEMENT PRODUCT		IMPORTANCE
	DETAILS OF REPLACEMENT	INFORMATION OF COMPONENT	PRODUCT NAME	PRICE	
PC-02	CPU REPLACEMENT	CPU-A	CPU-B	30,000 YEN	
PC-03	MEMORY REPLACEMENT	1024 MB	MEMORY-B	10,000 YEN	
PC-04	MEMORY REPLACEMENT	1024 MB	MEMORY-B	10,000 YEN	
PC-04	HDD REPLACEMENT	128 GB	HDD-B	8,000 YEN	
PC-04	SOFTWARE UPDATE	AAA	AAA	3,000 YEN	
Server-02	BODY REPLACEMENT		Server-B	130,000 YEN	

FIG. 9

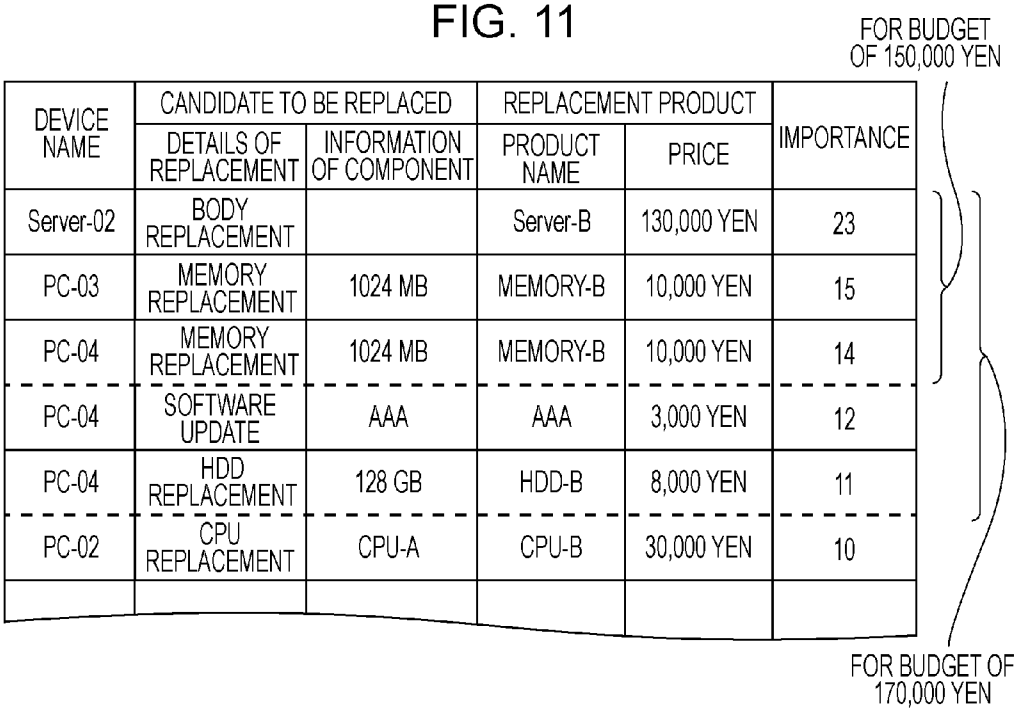
IMPORTANCE DETERMINATION ITEM	CONDITIONS	IMPORTANCE (ADDITIONAL VALUE)
DETAILS OF REPLACEMENT	BODY REPLACEMENT	5
	CPU REPLACEMENT	1
	MEMORY REPLACEMENT	4
	HDD REPLACEMENT	2
	SOFTWARE UPDATE	3
	•••	
DEVICE TYPE	SERVER	4
	PC	1
	•••	
CPU USAGE	60% – 79%	1
	80% OR MORE	2
MEMORY USAGE	80% OR MORE	1
HDD USAGE	90% OR MORE	1
OS	OS-A	1
	OS-B	2
	•••	
SOFTWARE	AAA	3
	BBB	1
	CCC	2
	DDD	2
	EEE	4
	FFF	1
	•••	

TRANSMISSION NETWORK TRAFFIC AMOUNT (DAILY AVERAGE)	50 MB – 99 MB	1
	100 MB – 499 MB	2
	500 MB OR MORE	3
RECEPTION NETWORK TRAFFIC AMOUNT (DAILY AVERAGE)	100 MB – 499 MB	1
	500 MB OR MORE	2
NUMBER OF CONNECTED DEVICES	5 – 9	1
	10 – 49	2
	50 OR MORE	3
NUMBER OF FILES HELD	1000 – 2999	1
	3000 – 4999	2
	5000 OR MORE	3

FIG. 10

DEVICE NAME	DETAILS OF REPLACEMENT	IMPORTANCE DETERMINATION ITEM			IMPORTANCE
		DETAILS OF REPLACEMENT	DEVICE TYPE	...	
PC-02	CPU REPLACEMENT	1	1		10
PC-03	MEMORY REPLACEMENT	4	1		15
PC-04	MEMORY REPLACEMENT	4	1		14
PC-04	HDD REPLACEMENT	2	1		11
PC-04	SOFTWARE UPDATE	3	1		12
Server-02	BODY REPLACEMENT	5	4		23

FIG. 11



DEVICE NAME	CANDIDATE TO BE REPLACED		REPLACEMENT PRODUCT		IMPORTANCE
	DETAILS OF REPLACEMENT	INFORMATION OF COMPONENT	PRODUCT NAME	PRICE	
Server-02	BODY REPLACEMENT		Server-B	130,000 YEN	23
PC-03	MEMORY REPLACEMENT	1024 MB	MEMORY-B	10,000 YEN	15
PC-04	MEMORY REPLACEMENT	1024 MB	MEMORY-B	10,000 YEN	14
PC-04	SOFTWARE UPDATE	AAA	AAA	3,000 YEN	12
PC-04	HDD REPLACEMENT	128 GB	HDD-B	8,000 YEN	11
PC-02	CPU REPLACEMENT	CPU-A	CPU-B	30,000 YEN	10

FIG. 12

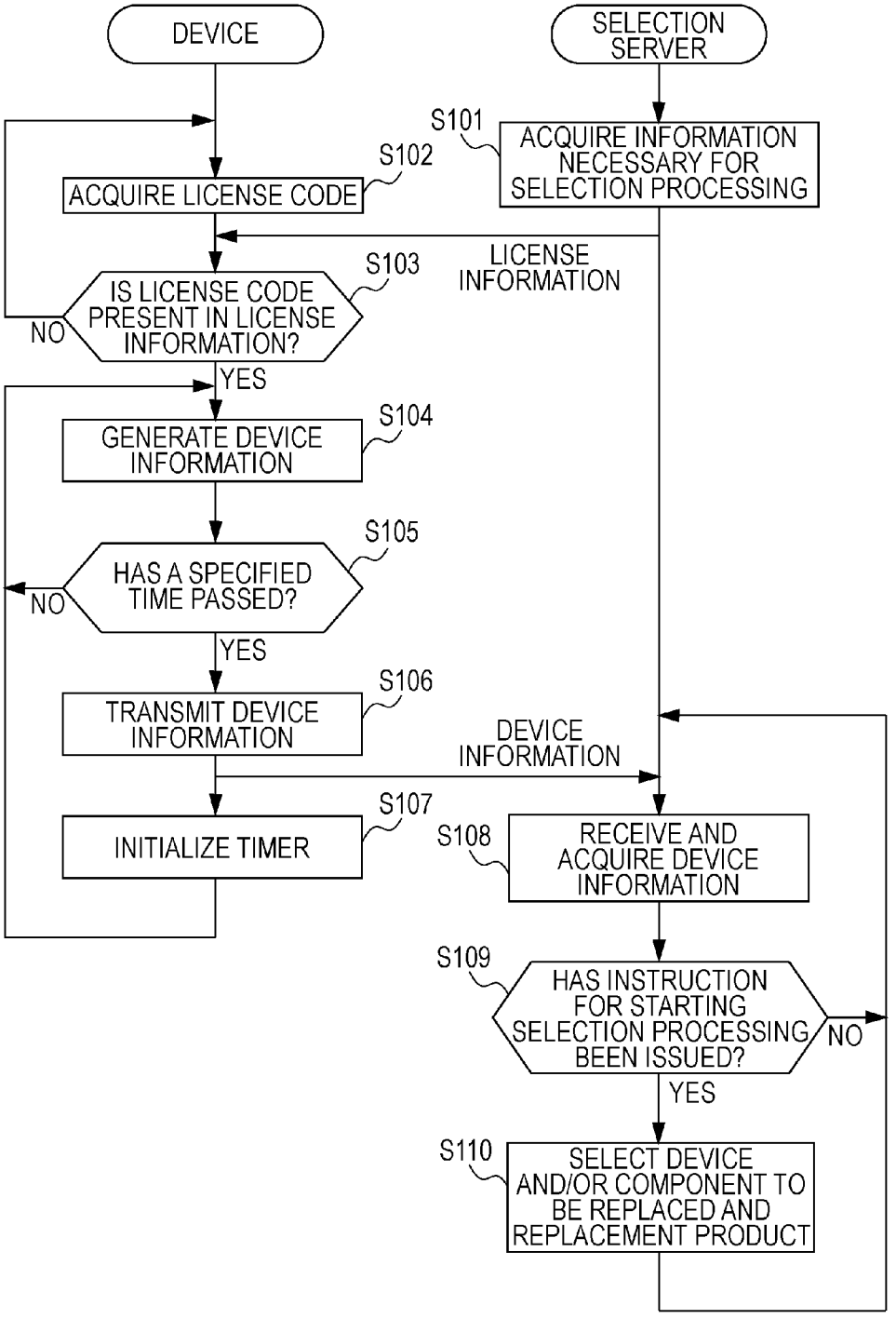
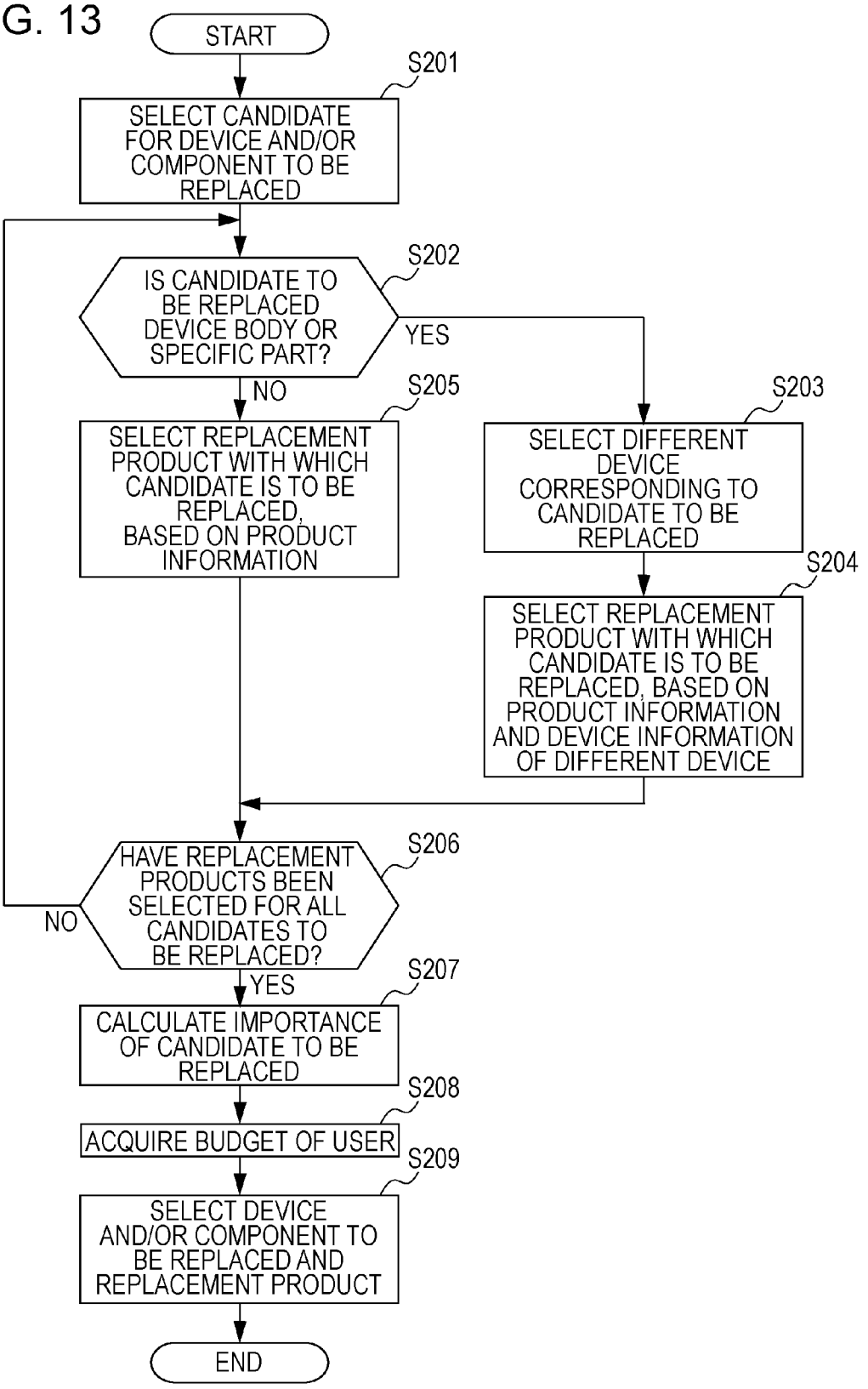

DEVICE
SELECTION SERVER
S101
ACQUIRE INFORMATION NECESSARY FOR SELECTION PROCESSING
S102
ACQUIRE LICENSE CODE
LICENSE INFORMATION
S103
IS LICENSE CODE PRESENT IN LICENSE INFORMATION?
NO
YES
S104
GENERATE DEVICE INFORMATION
S105
HAS A SPECIFIED TIME PASSED?
NO
YES
S106
TRANSMIT DEVICE INFORMATION
DEVICE INFORMATION
S107
INITIALIZE TIMER
S108
RECEIVE AND ACQUIRE DEVICE INFORMATION
S109
HAS INSTRUCTION FOR STARTING SELECTION PROCESSING BEEN ISSUED?
NO
YES
S110
SELECT DEVICE AND/OR COMPONENT TO BE REPLACED AND REPLACEMENT PRODUCT

FIG. 13


START
S201
SELECT CANDIDATE FOR DEVICE AND/OR COMPONENT TO BE REPLACED
S202
IS CANDIDATE TO BE REPLACED DEVICE BODY OR SPECIFIC PART?
YES
NO
S205
SELECT REPLACEMENT PRODUCT WITH WHICH CANDIDATE IS TO BE REPLACED, BASED ON PRODUCT INFORMATION
S203
SELECT DIFFERENT DEVICE CORRESPONDING TO CANDIDATE TO BE REPLACED
S204
SELECT REPLACEMENT PRODUCT WITH WHICH CANDIDATE IS TO BE REPLACED, BASED ON PRODUCT INFORMATION AND DEVICE INFORMATION OF DIFFERENT DEVICE
S206
HAVE REPLACEMENT PRODUCTS BEEN SELECTED FOR ALL CANDIDATES TO BE REPLACED?
NO
YES
S207
CALCULATE IMPORTANCE OF CANDIDATE TO BE REPLACED
S208
ACQUIRE BUDGET OF USER
S209
SELECT DEVICE AND/OR COMPONENT TO BE REPLACED AND REPLACEMENT PRODUCT
END

SELECTION SYSTEM, SELECTION SERVER, SELECTION METHOD, AND COMPUTER READABLE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and claims priority under 35 USC 119 from Japanese Patent Application No. 2013-213340 filed Oct. 11, 2013.

BACKGROUND

Technical Field

[0002] The present invention relates to a selection system, a selection server, a selection method, and a computer readable medium.

SUMMARY

[0003] According to an aspect of the invention, there is provided a selection system including an acquiring unit, a candidate selecting unit, and a product selecting unit. The acquiring unit acquires device information of multiple devices. The candidate selecting unit selects, from among the multiple devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced. The product selecting unit selects, based on a selection result by the candidate selecting unit and product information regarding multiple products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Exemplary embodiments of the present invention will be described in detail based on the following figures, wherein:

[0005] FIG. **1** is a system configuration diagram of a selection system according to an exemplary embodiment of the invention;

[0006] FIG. **2** is a function block diagram of the selection system;

[0007] FIG. **3** is a diagram illustrating an example of license information;

[0008] FIG. **4** is a diagram illustrating an example of device information;

[0009] FIG. **5** is a diagram illustrating an example of a selection result by a candidate-to-be-replaced selecting unit;

[0010] FIG. **6** is a diagram illustrating an example of product information;

[0011] FIG. **7** is a diagram illustrating an example of product information;

[0012] FIG. **8** is a diagram illustrating an example of a selection result by a product candidate selecting part;

[0013] FIG. **9** is a diagram illustrating an example of weighting information;

[0014] FIG. **10** is a diagram illustrating an example of a calculation result by an importance calculating part;

[0015] FIG. **11** is a diagram illustrating an example of a selection result by a product selecting unit;

[0016] FIG. **12** is a sequence diagram illustrating an example of a process performed in the selection system; and

[0017] FIG. **13** is a flowchart illustrating an example of selection processing.

DETAILED DESCRIPTION

[1. Exemplary Embodiment]

[0018] An exemplary embodiment of the present invention will be described hereinafter with reference to drawings.

[2. Configuration of Selection System]

[0019] FIG. **1** is a system configuration diagram of a selection system according to an exemplary embodiment of the invention. As illustrated in FIG. **1**, a selection system **1** is configured, for example, to include a selection server **10** and multiple devices **20** (**20-1** to **20-***m*) (m represents an integer of 2 or more). The selection server **10** is connected to each of the devices **20** through a communication network **2**.

[0020] The selection server **10** is implemented, for example, by a server computer or the like. The selection server **10** is configured to include, for example, a control unit **11** which is configured to include a central processing unit (CPU) and the like, a storage unit **12** which stores a program executed by the control unit **11** and various data, and a communication unit **13** which transmits and receives data to and from the devices **20** through the communication network **2**. The selection server **10** may include, in addition to the above components, an operation unit which is configured to include an input device, such as a keyboard, a mouse, and a touch panel, and a display unit which is configured to include a monitor and the like.

[0021] The devices **20** are implemented, for example, by hardware of various computers such as a personal computer, a printer, a scanner, and a multifunction machine. The devices **20** are each configured to include, for example, a control unit **21** which is configured to include a CPU and the like, a storage unit **22** which stores a program executed by the control unit **21** and various types of information regarding the device **20**, and a communication unit **23** which transmits and receives data to and from the selection server **10** through the communication network **2**. The devices **20** may each include, in addition to the above components, an operation unit, a display unit, and the like.

[0022] The selection system **1** selects, for example, a candidate for a device **20** to be replaced or a candidate for a component to be replaced (for example, a CPU, a memory, a program, or the like) from among multiple devices **20**, based on information of parts of the devices **20** (CPU usage, memory usage, and the like) and information of a program (version information, the release date and time at which the program was released, and the like) stored in the storage units **22** of the devices **20**, as usage statuses of components of the devices **20**. A candidate for a device **20** to be replaced or a candidate for a component to be replaced will also be referred to as a "candidate to be replaced", or simply referred to as a "candidate", hereinafter. The selection system **1** narrows down the above-mentioned candidates that truly need to be replaced, for example, by taking into consideration the budget of a user and the price of a replacement product or examining whether or not the above-mentioned candidate is indispensable. A detailed description of the configuration for realizing the above-mentioned processing will be provided hereinafter.

[3. Function Group Implemented in Selection System]

[0023] FIG. **2** is a function block diagram of the selection system **1**. As illustrated in FIG. **2**, the selection server **10** is configured to include, for example, an information storing

unit **101**, a device information acquiring unit **102**, a candidate-to-be-replaced selecting unit **103**, and a product selecting unit **104**. Further, as illustrated in FIG. **2**, the devices **20** are each configured to include, for example, an information storing unit **201**, an authenticating unit **202**, a device information generating unit **203**, and a device information transmitting unit **204**.

[0024] The individual functions illustrated in FIG. **2** are implemented, for example, by the control unit **11** of the selection server **10** executing a program stored in the storage unit **12** of the selection server **10**, and by the control unit **21** of the device **20** executing a program stored in the storage unit **22** of the device **20**. A detailed description of the above-mentioned function group will be provided hereinafter.

[3-1. Information Storing Unit]

[0025] The information storing unit **101** is generally implemented by the storage unit **12**. The information storing unit **101** stores various types of information to be referred to in selection processing, which will be described later, such as license information which indicates a list of license codes, device information, information which indicates a criterion set for each component of the devices **20**, product information regarding multiple products, and weighting information which indicates an additional value of an importance. A detailed description of the above-mentioned information will be provided later.

[0026] The information storing unit **201** is generally implemented by the storage unit **22** of each of the devices **20**. The information storing unit **201** stores various types of information regarding the device **20**. The information storing unit **201** stores, for example, a device name and type for identifying the device **20**, and information regarding components of the device **20**. The expression "components of the device **20**" mentioned here represents, for example, parts of the device **20** and a program stored in the storage unit **22**.

[0027] The information storing unit **201** stores, for example, information for identifying parts of the device **20**, such as the name of a CPU, the memory capacity, and the capacity of a hard disk drive (HDD) of the device **20**. Further, the information storing unit **201** stores information regarding a program stored in the storage unit **22**, such as the name and version information (or the release date) of a program. Specifically, information regarding a program includes version information (or the release date) of a basic input/output System (BIOS), an operating system (OS), software and firmware to implement various functions, a library required to operate software, and the like of the device **20**.

[3-2. Authenticating Unit]

[0028] The authenticating unit **202** is generally implemented by the control unit **21** and the communication unit **23** of each of the devices **20**. The authenticating unit **202** acquires a license code, and based on the license code and license information stored in the information storing unit **101**, approves execution of device information generation processing by the device information generating unit **203**, which will be described later, and execution of device information transmission processing by the device information transmitting unit **204**, which will be described later. For example, the license code may be used as authentication information required for executing the device information generating unit **203** and the device information transmitting unit **204**, which will be described later, in the device **20**, or may be used as information for identifying a group or budget described later.

[0029] The authenticating unit **202** acquires, for example, a license code through reception of input from a user. The information storing unit **201** may also store a license code regarding the device **20**, and the authenticating unit **202** may acquire a license code from information stored beforehand in the information storing unit **201**.

[0030] For example, the authenticating unit **202** refers to license information stored in the information storing unit **101** of the selection server **10** through the communication unit **23**. When the acquired license code is not present in the license information, the authenticating unit **202** restricts the device information generating unit **203** so as not to execute device information generation processing described later and restricts the device information transmitting unit **204** so as not to execute device information transmission processing described later.

[0031] FIG. **3** is a diagram illustrating an example of license information. As illustrated in FIG. **3**, for example, a license code, a group name for identifying a group associated with the license code, a group type indicating the type of a group, a group size indicating the size of a group, and budget information, are stored in license information. A group mentioned here represents a group to which a user and the device **20** belongs, that is, for example, a company, a section, a government office, a school, or the like. Further, information indicating a company name, an industry type, and the number of workers may be stored as a group name, a group type, and a group size, respectively, in license information.

[0032] The license information illustrated in FIG. **3** is merely an example and license information is not limited to this. License information may include, for example, a password regarding authentication processing of a license code or other types of information such as a device name for identifying the device **20**.

[3-3. Device Information Generation Unit]

[0033] The device information generating unit **203** is generally implemented by the control unit **21** of each of the devices **20**. The device information generating unit **203** generates, for example, device information of the device **20**, based on information regarding the device **20** stored in the information storing unit **201**. Further, the device information generating unit **203** generates, for example, device information indicating the usage statuses of components of the device **20**, based on information regarding the usage statuses of the components of the device **20** stored in the information storing unit **201**.

[0034] FIG. **4** is a diagram illustrating an example of device information. Information regarding multiple devices **20** is stored in device information. As illustrated in FIG. **4**, for example, a license code acquired by the authenticating unit **202**, the device name of the device **20**, and the type of the device **20** are stored in the device information. Further, regarding the device information, for example, the name of a CPU, the memory capacity, and the capacity of an HDD of the device **20** are stored as information for identifying parts among the components of the device **20**.

[0035] Furthermore, from among information indicating the usage statuses of components of the device **20**, information regarding parts of the device **20**, such as the CPU usage, the memory usage, and the HDD usage, is stored in device information. The device information generating unit **203** cal-

culates, for example, the CPU usage from the ratio of a time during which the CPU is being used (the ratio of a time during which the CPU is performing certain processing to a time during which the CPU is not performing any processing) to generate device information. Further, the device information generating unit **203** calculates the memory usage from the ratio of the amount of memory used (or free space) to the memory capacity, and calculates the HDD usage from the ratio of the amount of HDD used (or free space) to the HDD capacity, to generate device information. The device information generating unit **203** may calculate the daily average (the average value of numerical values calculated specified number of times a day) to generate device information.

[0036] Furthermore, from among information indicating the usage statuses of components of the device **20**, information regarding a program, such as a BIOS date, the name and version information of an OS, the name and version information of software, and information regarding a principal process representing software whose execution time (activation time) at the device **20** is at a standard level or higher, is stored in device information. The device information generating unit **203** measures the activation time of each piece of software and acquires information regarding the principal process from the software whose startup time is at a standard level or higher to generate device information.

[0037] Furthermore, other types of information, such as the transmission network traffic amount and the reception network traffic amount of the device **20**, the number of connected devices representing the number of devices or apparatuses connected to the device **20** through the communication network **2**, and the number of files held in the device **20**, are also stored in device information. The device information generating unit **203** measures, for example, the transmission (reception) network traffic amount and the number of connected devices, based on the communication status of the communication unit **23**, and counts the number of files held in the device **20**, to generate device information of the device **20**. The device information generating unit **203** may calculate the daily average (the average value of numerical values measured specified number of times a day) to generate device information.

[0038] The device information illustrated in FIG. **4** is merely an example and device information is not limited to this. Device information may also include, for example, other types of information regarding the device **20** (for example, the temperature of the CPU, the renewal date of a specific electronic file, and the like). Alternatively, device information may also include other types of information, such as the name of a group to which the device **20** belongs.

[0039] The device information regarding the device **20** generated by the device information generating unit **203** is stored, for example, in the information storing unit **201**.

[3-4. Device Information Transmission Unit]

[0040] The device information transmitting unit **204** is generally implemented by the control unit **21** and the communication unit **23** of the device **20**. The device information transmitting unit **204** transmits, for example, device information stored in the information storing unit **201** to the selection server **10** connected through the communication network **2**.

[0041] For example, the device information transmitting unit **204** may include a timer and transmit the device information regularly. In this case, the device information transmitting unit **204** transmits the device information when the time measured by the timer has reached a specified time. Further, the device information transmitting unit **204** may, for example, transmit the device information when a predetermined time has been reached. Alternatively, the device information transmitting unit **204** may, for example, transmit the device information when receiving a request for device information from the selection server **10**.

[3-5. Device Information Acquiring Unit]

[0042] The device information acquiring unit **102** is generally implemented by the control unit **11** and the communication unit **13** of the selection server **10**. The device information acquiring unit **102** acquires device information of multiple devices **20**. The device information acquiring unit **102** also acquires device information representing the usage statuses of components of the multiple devices **20**.

[0043] For example, the device information acquiring unit **102** acquires, through reception of device information transmitted from each of the devices **20**, the device information regarding the device **20**. The device information acquired by the device information acquiring unit **102** is stored, for example, in the information storing unit **101** of the selection server **10**. The device information acquiring unit **102** may store device information in a chronological order by storing in the information storing unit **101** the date and time at which device information transmitted from each of the devices **20** was received, in association with the device information.

[3-6. Candidate-to-be-replaced Selecting Unit]

[0044] The candidate-to-be-replaced selecting unit **103** is generally implemented by, for example, the control unit **11** of the selection server **10**. The candidate-to-be-replaced selecting unit **103** selects, from among the multiple devices **20** and/or components of the devices **20**, a candidate for a device **20** and/or a component to be replaced, based on the device information acquired by the device information acquiring unit **102**. That is, the candidate-to-be-replaced selecting unit **103** selects, from among the multiple devices **20**, a device **20** whose device information does not meet a predetermined criterion, as a candidate for a device **20** to be replaced. Further, when a component whose usage status does not meet a predetermined criterion exists, the candidate-to-be-replaced selecting unit **103** selects, from among multiple components, a candidate for a component to be replaced.

[0045] When the usage status of a part of the device **20** out of components of the devices **20** represented by device information does not meet a criterion defined for each type of part, the candidate-to-be-replaced selecting unit **103** selects the component or the device **20** as a candidate to be replaced.

[0046] For example, regarding the device information illustrated in FIG. **4**, when a criterion defined for a CPU is "CPU usage: 40% or less", the CPU of "PC-02" whose CPU usage exceeds the threshold "40%" and which does not meet the criterion is selected as a candidate to be replaced.

[0047] Further, for example, when a criterion defined for a memory is "memory usage: 70% or less", memories of "PC-03" and "PC-04" whose memory usage exceeds the threshold "70%" and which do not meet the criterion are selected as candidates to be replaced. Furthermore, for example, when a criterion defined for an HDD is "HDD usage: 70% or less", the HDD of "PC-04" whose HDD usage exceeds the threshold "70%" and which does not meet the criterion is selected as a candidate to be replaced.

[0048] In the case where the usage status of a part of a device **20** does not meet a criterion as described above, for example, the candidate-to-be-replaced selecting unit **103** may select the body of the device **20** as a candidate to be replaced or select a part different from the corresponding part as a candidate to be replaced. For example, when the CPU usage exceeds a threshold, the candidate-to-be-replaced selecting unit **103** may select a CPU fan as a candidate to be replaced.

[0049] Alternatively, when, from among components of the devices **20** represented by device information, version information or the release date of a program stored in a device **20** does not meet a criterion defined for each type of program, the candidate-to-be-replaced selecting unit **103** may select the program or the device **20** as a candidate to be replaced.

[0050] For example, when a criterion regarding BIOS is "BIOS date: 1/1/2005 or later", the body of "Server-02" whose BIOS date is the day immediately before the threshold "1/1/2005" and which does not meet the criterion is selected as a candidate to be replaced.

[0051] In addition, for example, when a criterion regarding software "AAA" is "version information: 2.0 or later", software "AAA" of "PC-04" which does not meet the criterion is selected as a candidate to be replaced. Replacement of software represents updating of the corresponding program or replacing the corresponding program with a different program.

[0052] In addition, the candidate-to-be-replaced selecting unit **103** may, for example, select a candidate to be replaced, based on version information (or release date) of a library necessary for opening an OS or software.

[0053] In addition, for example, the candidate-to-be-replaced selecting unit **103** may select, based on a combination of version information (or release date) of multiple programs having a dependence relationship, at least one of the multiple programs having the dependence relationship as a candidate to be replaced. In this case, for example, the information storing unit **101** may store information indicating the dependence relationship of the multiple programs, and the candidate-to-be-replaced selecting unit **103** may select a program having the dependence relationship as a candidate to be replaced by referring to the information indicating the dependence relationship.

[0054] Further, the candidate-to-be-replaced selecting unit **103** may acquire the various criteria mentioned above, for example, from information stored in the information storing unit **101**. In addition, the candidate-to-be-replaced selecting unit **103** may acquire the above-mentioned various criteria through reception at the communication unit **13** of the selection server **10** or through reception of input from a user via the operation unit of the selection server **10**.

[0055] Furthermore, the candidate-to-be-replaced selecting unit **103** may select a candidate to be replaced, based on device information whose license code matches a license code to be selected. In this case, a license code to be selected may be, for example, stored in the information storing unit **101** in advance, or may be acquired through reception by the communication unit **13** or through reception of input from a user at the selection server **10**. As a license code to be selected, for example, a license code associated with a specific group name may be acquired from license information stored in the information storing unit **101**.

[0056] FIG. **5** is a diagram illustrating an example of a selection result by the candidate-to-be-replaced selecting unit **103**. As illustrated in FIG. **5**, for example, the candidate-to-be-replaced selecting unit **103** selects a candidate to be replaced, by acquiring a device name regarding the candidate to be replaced, the details of replacement for the device **20**, and information of a component to be replaced, from device information acquired by the device information acquiring unit **102**.

[3-7. Product Selecting Unit **104**]

[0057] The product selecting unit **104** is generally implemented by the control unit **11** of the selection server **10**. The product selecting unit **104** selects, based on a selection result by the candidate-to-be-replaced selecting unit **103** and product information regarding multiple products that match a predetermined criterion, a device **20** to be replaced from among selected candidates, and a product with which the device **20** is to be replaced. The product selecting unit **104** also selects, based on a selection result by the candidate-to-be-replaced selecting unit **103** and product information regarding multiple products that meet a predetermined criterion, a component to be replaced from among selected candidates, and a product with which the component is to be replaced.

[0058] The product selecting unit **104** refers to, for example, product information stored in the information storing unit **101**. FIGS. **6** and **7** are diagrams illustrating examples of product information. FIG. **6** is a diagram illustrating an example of product information regarding components (for example, parts and software) of the devices **20**. FIG. **7** is a diagram illustrating an example of product information regarding the body of each of the devices **20**. As illustrated in FIGS. **6** and **7**, product information includes information regarding the price and performance of various products. The price of software represents the amount of money required for updating or replacement of software.

[0059] The product information illustrated in FIGS. **6** and **7** is merely examples and product information is not limited to the examples illustrated in FIGS. **6** and **7**. In addition, for example, product information may include version information, the release date, the manufacturer, the model, and the like for identifying a product.

[0060] The product selecting unit **104** acquires, for example, the above-mentioned product information from information stored in the information storing unit **101**. In addition, for example, the product selecting unit **104** may acquire the product information through reception at the communication unit **13** of the selection server **10** or through reception of input from a user via the operation unit of the selection server **10**.

[0061] The product selecting unit **104** may select a replacement product with which a candidate selected by the candidate-to-be-replaced selecting unit **103** is to be replaced, and may make a selection based on information regarding the price of the selected product and information of the budget of a user.

[0062] Furthermore, the product selecting unit **104** may, for example, make a selection based on the importance of a candidate selected by the candidate-to-be-replaced selecting unit **103**.

[0063] In the exemplary embodiment, the product selecting unit **104** includes, for example, a device selecting part **105**, a product candidate selecting part **106**, an importance calculating part **107**, and a budget information acquiring part **108**.

[3-7-1. Device Selecting Part]

[0064] For example, in the case where a candidate selected by the candidate-to-be-replaced selecting unit **103** is the body or a specific part (for example, a CPU or the like) of a device **20**, the device selecting part **105** selects, from among the multiple devices **20**, a different device **20** that is different from the device **20** regarding the candidate selected by the candidate-to-be-replaced selecting unit **103**. In this case, the product selecting unit **104** makes a selection based on device information regarding the different device **20**.

[0065] Here, device information of the different device **20** selected by the device selecting part **105** meets a criterion. Therefore, the device **20** is determined not to need to be replaced. In this case, the product selecting unit **104** makes a selection based on device information of the device **20** that does not need to be replaced.

[0066] The device selecting part **105** may, for example, select the different device **20** whose purpose matches or is similar to that of the device **20** regarding the candidate selected by the candidate-to-be-replaced selecting unit **103**. In this case, the product selecting unit **104** makes a selection based on device information of the different device **20** whose purpose matches or is similar to that of the device **20** regarding the candidate to be replaced.

[0067] Here, the purpose of the device **20** is identified, for example, based on the type, the OS, the principal process, and the like of the device **20** of device information. Here, the case where the purpose is the same between devices represents the case where all the elements mentioned above match between the devices. Further, the case where the purpose is similar between devices represents the case where at least one of the elements mentioned above matches between the devices. The device selecting part **105** selects, for example, a different device **20** having device information of which all of the type, the OS, and the principal process match those of device information of the device **20** regarding the selected candidate or a different device **20** having device information of which at least one of the elements mentioned above matches that of the device information of the device **20** regarding the selected candidate.

[0068] In addition, for example, the device selecting part **105** may select the different device **20**, based on a group to which the device **20** regarding the candidate selected by the candidate-to-be-replaced selecting unit **103** belongs. In this case, the product selecting unit **104** makes a selection based on a group to which the device **20** regarding the candidate selected by the candidate-to-be-replaced selecting unit **103**, from among the multiple devices **20**, belongs.

[0069] Here, the group name of the device **20** is, for example, associated with a license code stored in device information. For example, the name of a group to which "Server-02" belongs is "Company A" which is associated with license code "001" in license information.

[0070] For example, in the case where the CPU of "PC-02" is selected by the candidate-to-be-replaced selecting unit **103** as a candidate to be replaced, the device selecting part **105** selects, as a different device **20**, "PC-01" of which all information representing the purpose (the type, OS, and principal process of the device **20**) and the group name match those of "PC-02" and whose body or component is not selected as a candidate to be replaced.

[0071] Furthermore, for example, in the case where "Server-02" is selected by the candidate-to-be-replaced selecting unit **103** as a candidate to be replaced, the device selecting part **105** selects, as a different device **20**, "Server-01" of which part (the type and OS of the device **20**) of information representing the purpose and the group name match those of "Server-02" and whose body or component is not selected as a candidate to be replaced.

[0072] For example, in the case where a different device **20** whose purpose matches that of the device **20** to be replaced is not found in the same group, the device selecting part **105** may acquire a group that is similar to the corresponding group in license information and select the different device **20**. Here, the case where a group is similar to another group represents, for example, the case where the group type is the same between the groups and the group size is the same between the groups or a difference in the group size between the groups is smaller than or equal to a reference value.

[0073] The device selecting part **105** may, for example, select a device **20** which belongs to "Company B", which is a group similar to "Company A". The device selecting part **105** may, for example, select "Server-03" of which all information regarding the purpose of the device **20** (the type, OS, and principal process of the device **20**) matches that of "Server-02", of which the group to which the device belongs is similar to that of "Server-02", and whose body or component is not selected as a candidate to be replaced.

[3-7-2. Product Candidate Selecting Part]

[0074] The product candidate selecting part **106** selects a replacement product (hereinafter, also referred to as a "product candidate") with which a candidate selected by the candidate-to-be-replaced selecting unit **103** is to be replaced.

[0075] For example, in the case where a candidate selected by the candidate-to-be-replaced selecting unit **103** is the body or a specific part (for example, a CPU or the like) of a device **20**, the product candidate selecting part **106** selects a product candidate which matches or is similar to the body or a part of a different device **20** selected by the device selecting part **105**.

[0076] The product candidate selecting part **106** selects, for example, for the CPU of "PC-02" serving as a candidate to be replaced, "CPU-B" that matches the CPU of "PC-01" selected by the device selecting part **105**, as a product candidate.

[0077] In the case where product information does not include "CPU-B", the product candidate selecting part **106** may, for example, select a product candidate which is similar to "CPU-B", based on information of the type (name), the number of clocks, the number of cores, and the like of "CPU-B".

[0078] Further, for example, in the case where "Server-01" is selected by the device selecting part **105** for the body of "Server-02" serving as a candidate to be replaced, the product candidate selecting part **106** selects "Server-B" whose CPU, memory capacity, and HDD capacity match those of "Server-01", as a product candidate.

[0079] For example, in the case where "Server-03" is selected by the device selecting part **105** for the body of "Server-02" serving as a candidate to be replaced, the product candidate selecting part **106** may select "Server-C" whose CPU and memory capacity match those of "Server-03", as a product candidate.

[0080] In addition, for example, in the case where a candidate selected by the candidate-to-be-replaced selecting unit **103** is a part (for example, a memory, an HDD, or the like) that is different from the specific part, the product candidate

selecting part **106** selects, for example, a product candidate having a performance higher than the selected candidate, from product information.

[0081] For example, the product candidate selecting part **106** selects, for a memory of "PC-03" serving as a candidate to be replaced, "memory-B" whose capacity is greater than the memory capacity (**1024** MB). Further, for example, the product candidate selecting part **106** selects, for a memory of "PC-04" serving as a candidate to be replaced, "memory-C" whose capacity is greater than the memory capacity (2048 MB), and for an HDD of "PC-04" serving as the candidate to be replaced, "HDD-B" whose capacity is greater than the HDD capacity (120 GB).

[0082] In the case where the product candidate selecting part **106** selects a product for a memory serving as a candidate to be replaced, the product candidate selecting part **106** may select a memory which meets a criterion regarding a memory "memory usage: 70% or less". For example, since the used amount of memory of "PC-03" is about 922 MB (1024 MB×0.9), a memory which is to be selected here needs a memory capacity of at least 1318 MB (922 MB/0.7) or more. Therefore, the product candidate selecting part **106** may, for example, calculate a condition regarding the performance of a product, based on a criterion regarding a candidate selected by the candidate-to-be-replaced selecting unit **103**, and select a product that meets the calculated condition, as a product candidate with which the selected candidate is to be replaced.

[0083] Further, the product candidate selecting part **106** may, for example, select a product candidate of the lowest price from among product candidates that meet a condition of a replacement product with which a candidate to be replaced is to be replaced.

[0084] In addition, for example, in the case where a candidate selected by the candidate-to-be-replaced selecting unit **103** is a program, the product candidate selecting part **106** selects, for example, a product candidate that is the same product as and that is newer than the selected candidate, from product information. For example, the product candidate selecting part **106** selects, for software "AAA" of "PC-04" serving as a candidate to be replaced, the latest version of "AAA" in product information.

[0085] FIG. **8** is a diagram illustrating an example of a selection result by the product candidate selecting part **106**. As illustrated in FIG. **8**, the product candidate selecting part **106** selects, for a candidate to be replaced, a replacement product candidate with which the candidate to be replaced is to be replaced, and acquires the name and price of the selected product candidate.

[3-7-3. Importance Calculating Part]

[0086] The importance calculating part **107** calculates, based on device information, the importance of a candidate selected by the candidate-to-be-replaced selecting unit **103**. The importance of a candidate represents an index value indicating the replacement priority of the candidate.

[0087] For example, the importance calculating part **107** calculates, for example, the importance of the selected candidate, based on weighting information of the importance.

[0088] FIG. **9** is a diagram illustrating an example of weighting information. For example, the importance calculating part **107** refers to weighting information and determines whether or not device information regarding a candidate selected by the candidate-to-be-replaced selecting unit **103** meets a condition set for each importance determination item. When the device information meets the condition, the importance calculating part **107** adds an additional value of the importance set for the condition to the importance of the candidate.

[0089] For example, in the case where the details of replacement for a candidate selected by the candidate-to-be-replaced selecting unit **103** indicate "CPU replacement", as illustrated in FIG. **9**, "1" is added to the importance of the candidate. In the case where the details of the replacement indicate "memory replacement", "2" is added to the importance of the candidate.

[0090] Further, for example, in the case where the type of a device **20** regarding a candidate selected by the candidate-to-be-replaced selecting unit **103** is "server", "3" is added to the importance of the candidate. Further, in the case where the type of the device **20** is "PC", "1" is added to the importance of the candidate.

[0091] Furthermore, for example, an additional value set for each condition, in accordance with the usage status (for example, CPU usage, memory usage, HDD usage, or the like) of a part out of the usage statuses of components of the device **20** selected as a candidate by the candidate-to-be-replaced selecting unit **103**, may be added to the importance of the candidate.

[0092] Furthermore, for example, an additional value set for each condition, in accordance with information (for example, the OS, software, or the like) of a program stored in a device **20** regarding a candidate selected by the candidate-to-be-replaced selecting unit **103**, may be added to the importance of the candidate.

[0093] Furthermore, for example, in the case where the transmission network traffic amount, the reception network traffic amount, the number of connected devices, and the number of files held of a device **20** regarding a candidate selected by the candidate-to-be-replaced selecting unit **103** meet conditions defined individually, the importance of the candidate may be added.

[0094] The weighting information illustrated in FIG. **9** is merely an example and weighting information is not limited to this. For example, second, third, and other conditions may be set for the weighting information. In this case, in the case where all the defined conditions are met (or at least one of the conditions is met), the importance calculating part **107** may add an additional value set for the corresponding conditions (or condition) to the importance of a candidate to be replaced.

[0095] FIG. **10** is a diagram illustrating an example of a calculation result by the importance calculating part **107**. For example, as illustrated in FIG. **10**, the importance calculating part **107** calculates the importance of a candidate selected by the candidate-to-be-replaced selecting unit **103** by adding an additional value of an importance set for each importance determination item.

[3-7-4. Budget Information Acquiring Part]

[0096] The budget information acquiring part **108** acquires information of the budget of a user. The budget information acquiring part **108** acquires, for example, information of a budget that may be used for replacement of a device **20** and/or a component of a device **20** from information stored in the information storing unit **101**. The budget information acquiring part **108** acquires, for example, information of a budget associated with a license code input by a user, out of information of budgets stored in license information. In addition, for example, the budget information acquiring part **108** may

acquire information of a budget through reception at the communication unit **13** of the selection server **10** or through reception of input from a user via the operation unit of the selection server **10**.

[0097] For example, the product selecting unit **104** makes a selection based on the importance calculated by the importance calculating part **107** and information on the budget of a user acquired by the budget information acquiring part **108**.

[0098] FIG. **11** is a diagram illustrating an example of a selection result by the product selecting unit **104**. As illustrated in FIG. **11**, for example, the product selecting unit **104** sorts candidates selected by the candidate-to-be-replaced selecting unit **103** in descending order of priority, and makes a selection in accordance with the sorted order in such a manner that the total sum of the prices of replacement products with which the candidates are to be replaced does not exceed the budget of a user acquired by the budget information acquiring part **108**.

[0099] In FIG. **11**, for example, in the case where the budget of a user is 150,000 yen, the product selecting unit **104** selects a device **20**, components, and replacement products with which the device **20** and the components are to be replaced in such a manner that the total sum of the prices of the replacement products does not exceed the budget of the user, as described below.

[0100] Body of "Server-02" and "Server-B"

[0101] Memory of "PC-03" and "memory-B"

[0102] Memory of "PC-04" and "memory-B"

[0103] Further, for example, in FIG. **11**, in the case where the budget of a user is 170,000 yen, the product selecting unit **104** selects components and replacement products with which the components are to be replaced, as described below, in addition to the product group mentioned above.

[0104] Software "AAA" of "PC-04" and latest version of "AAA"

[0105] HDD of "PC-04" and "HDD-B"

[0106] For example, the product selecting unit **104** may make a selection based on a replacement product with which a candidate selected by the candidate-to-be-replaced selecting unit **103** is to be replaced, without depending on the importance of the candidate. For example, the product selecting unit **104** may select a device **20** and/or a component of a device **20** to be replaced, and replacement products/a replacement product with which the device **20** and/or the component of the device **20** are/is to be replaced, in ascending order of product price, so that the total sum of the prices of the products does not exceed the budget of a user.

[0107] Further, for example, the product selecting unit **104** may make a selection based on, for example, the importance of a candidate selected by the candidate-to-be-replaced selecting unit **103**, without depending on the prices of products and the budget of a user. The product selecting unit **104** may, for example, select candidates up to the n-th candidate (n represents a natural number), out of the selected candidates, in descending order of priority, and replacement products with which the candidates are to be replaced. In this case, after the importance is calculated by the importance calculating part **107**, the product selecting unit **104** may select a product candidate selected by the product candidate selecting part **106** as a replacement product.

[4. Processing Performed in Selection System]

[0108] Next, processing performed by the selection system **1** in the exemplary embodiment will be explained.

[4-1. Overall Process]

[0109] FIG. **12** is a sequence diagram illustrating an example of a process performed by the selection system **1**. A process in which device information of devices **20** is transmitted to the selection server **10** and selection processing for selecting a device **20** and/or a component of a device **20** to be replaced, and replacement products/a replacement product with which the device **20** and/or the component of the device **20** are/is to be replaced, will be described below.

[0110] As illustrated in FIG. **12**, first, the control unit **11** of the selection server **10** acquires information necessary for selection processing (S**101**). Specifically, the control unit **11** acquires license information indicating a list of license codes, information indicating criteria set for individual components of the devices **20**, product information regarding multiple products, and weighting information indicating an additional value of an importance, and stores the acquired information into the storage unit **12** of the selection server **10**. The information mentioned above may be acquired through reception at the communication unit **13** of the selection server **10** or through reception of input from a user via the operation unit of the selection server **10**.

[0111] The control unit **21** of the device **20** acquires a license code through reception of input from a user or from information stored in the storage unit **22** (S**102**). The control unit **21** refers to the license information stored in the storage unit **12** of the selection server **10**, and determines whether or not the license code acquired in S**102** is present in the license information (S**103**).

[0112] In the case where the license code acquired in S**102** is present in the license information (Yes in S**103**), the control unit **21** generates device information of the device **20** (device information indicating the usage statuses of components of the device **20**) (S**104**). The control unit **21** measures the elapsed time of a timer (S**105**). When a specified time has passed (YES in S**105**), the control unit **21** transmits to the selection server **10** the device information generated in S**104** (S**106**), and initializes the elapsed time of the timer (S**107**). The control unit **21** controls device information to be in the latest state by sequentially generating (or updating) device information regarding the device **20** (S**104**). The control unit **21** may transmit device information, for example, when a predetermined time is reached, without performing the processing in S**105** and S**107**.

[0113] The control unit **11** of the selection server **10** acquires device information of the device **20** by receiving the device information transmitted in S**106** (S**108**). The control unit **11** determines whether or not an instruction for starting the selection processing has been issued by the user (S**109**). In the case where it is determined that the instruction for starting the selection processing has been issued (YES in S**109**), the control unit **11** selects, from among multiple devices **20**, a device **20** to be replaced and/or a component to be replaced, and replacement products/a replacement product with which the device **20** and/or the component to be replaced are/is to be replaced (S**110**). The control unit **11** controls device information of the devices **20** to be in the latest state by sequentially receiving and acquiring the device information regarding the devices **20** (S**108**).

[4-2. Selection Processing]

[0114] Next, the details of the selection processing performed in S**110** will be explained. FIG. **13** is a flowchart illustrating an example of selection processing. As illustrated in FIG. **13**, the control unit **11** of the selection server **10** selects, based on the device information acquired in S**108**, a candidate for a device **20** to be replaced and/or a candidate for a component to be replaced (candidate/candidates to be replaced), from among the multiple devices **20** (S**201**). That is, in S**201**, the control unit **11** selects a device **20** whose device information does not meet a predetermined criterion, from among the multiple devices **20**, as a candidate for a device **20** to be replaced. Furthermore, in S**201**, in the case where a component whose usage status does not meet a predetermined criterion exists, the control unit **11** selects a candidate for a component to be replaced, from among multiple components.

[0115] For example, the control unit **11** compares the device information acquired in S**108** with criteria (for example, the CPU usage, BIOS date, version information of a program, and the like) defined based on components of the devices **20**, and selects a candidate to be replaced, as illustrated in FIG. **5**, from among devices **20** and components that do not meet the criteria.

[0116] The control unit **11** determines whether or not the candidate to be replaced selected in S**201** is the body and/or a specific part of the device **20** (S**202**). When the selected candidate is the body or a specific part of the device **20** (YES in S**202**), the control unit **11** selects a different device **20** corresponding to the candidate to be replaced (S**203**), and selects, based on product information regarding multiple products that meet a predetermined criterion and device information of the different device **20** selected in S**203**, a replacement product (product candidate) with which the candidate to be replaced is to be replaced (S**204**).

[0117] For example, in the case where the candidate to be replaced selected in S**201** is a CPU, the control unit **11** selects a different device **20** of which at least one of the type, OS, and principal process matches those of the device **20** regarding the candidate and of which the name of a group matches or is similar to the name of the group to which the device **20** belongs, and selects, from among products represented by product information, a product which matches or is similar to the CPU of the different device **20** as a product candidate with which the CPU serving as a candidate to be replaced is to be replaced.

[0118] In the case where the candidate to be replaced selected in S**201** is a component different from a specific part (NO in S**202**), the control unit **11** selects, based on product information regarding multiple products that meet a predetermined criterion, a replacement product (product candidate) with which the candidate to be replaced is to be replaced (S**205**).

[0119] For example, in the case where the candidate to be replaced selected in S**201** is a memory, the control unit **11** selects a memory whose capacity is greater than the memory from product information, and defines the memory as a product candidate with which the candidate to be replaced is to be replaced.

[0120] The control unit **11** determines whether or not replacement products for all the candidates to be replaced have been selected (S**206**), and repeats the selection processing for product candidates (S**202** to S**205**) until product candidates with which all the candidates to be replaced are to be replaced have been selected (YES in S**206**). As illustrated in FIG. **8**, the control unit **11** selects product candidates for all the candidates to be replaced.

[0121] The control unit **11** calculates the importance of the candidate to be replaced selected in S**201** (S**207**). The control unit **11** acquires information of the budget of a user for replacement of a device **20** and/or a component of a device **20** (S**208**). The control unit **11** selects, from among the selected candidates, a device **20** to be replaced and/or a component to be replaced, and replacement products/a replacement product with which the device **20** to be replaced and/or the component to be replaced are/is to be replaced (S**209**), and terminates the processing of S**110**.

[0122] For example, as illustrated in FIG. **11**, the control unit **11** makes a selection based on the order of importances calculated in S**206** in such a manner that the total sum of the prices of replacement products with which the candidates selected in S**201** are to be replaced does not exceed the budget of the user acquired in S**207**.

[0123] S**202** to S**206** and S**207** may be exchanged with each other. That is, after performing the processing for selecting a candidate to be replaced in S**201**, the control unit **11** may calculate the importance of the candidate in S**207**, and then select a replacement product with which a candidate whose importance is determined to be high is to be replaced in the processing of S**202** to S**206** and S**209**. In this case, the control unit **11** may select a device **20** or component to be replaced and a replacement product, irrespective of the budget of a user, without performing processing for acquiring the budget in S**208**.

[0124] Further, the control unit **11** may make a selection without performing processing for calculating an importance in S**207**. In this case, for example, the control unit **11** may make a selection in ascending order of product price.

[5. Conclusion]

[0125] In the selection system **1** according to the exemplary embodiment, device information regarding multiple devices **20** is acquired, and a device **20** to be replaced and/or a component to be replaced, and replacement products/a replacement product with which the device **20** and/or the component to be replaced are/is to be replaced, are selected from among the multiple devices **20**. For example, the selection system **1** selects a replacement configuration (a combination of a device **20** or a component to be replaced, and a replacement product) in order to achieve optimization of the entire system.

[0126] Furthermore, the selection system **1** acquires product information regarding multiple products and information of the budget of a user, and makes a selection based on the prices of the products and the budget of the user. Furthermore, the selection system **1** calculates the importance of a candidate to be replaced, and makes a selection based on the importance of the candidate to be replaced. For example, the selection system **1** selects a replacement configuration having the highest cost effectiveness, among replacement configurations that optimize the entire system.

[0127] Furthermore, in the selection system **1**, the devices **20** transmit device information to the selection server **10**, and the selection server **10** receives and acquires the device information, and makes a selection based on the device information transmitted from the multiple devices **20**. In addition, since device information is regularly transmitted from the devices **20** to the selection server **10**, the device information is maintained in the latest state.

[0128] Furthermore, the selection system **1** makes a selection based on device information of a device **20** that does not need to be replaced, through selection of a different device **20** that is different from the device **20** selected as a candidate to be replaced. For example, the selection system **1** selects a replacement product, from among devices **20** which are approved as operating normally.

[0129] Furthermore, the selection system **1** makes a selection based on a device **20** whose purpose matches or is similar to a device **20** regarding a candidate to be replaced, through selection of a different device **20** whose purpose matches or is similar to the device **20** regarding the candidate to be replaced. For example, the selection system **1** selects a replacement product from among devices **20** which are used in a way similar to a device **20** to be replaced (or a device **20** including a component to be replaced) and are approved as operating normally.

[0130] Furthermore, the selection system **1** makes a selection based on a group to which a device **20** regarding a candidate to be replaced belongs, through selection of a different device **20** based on the group to which the device **20** regarding the candidate to be replaced belongs. For example, the selection system **1** selects a replacement product from among devices **20** or components by other companies in the same industry.

[0131] The present invention is not limited to the exemplary embodiment described above, and modifications may be made to the present invention in an appropriate manner without departing from the scope of the present invention.

[6. Exemplary Variations]

[0132] (Exemplary Variation 1)

[0133] In the exemplary embodiment, the case where the authenticating unit **202** acquires a license code and execution of device information generation processing by the device information generating unit **203** and device information transmission processing by the device information transmitting unit **204** is approved based on the license code and license information stored in the information storing unit **101**, has been explained. For example, the selection system **1** may perform the device information generation processing and the device information transmission processing, without the above-mentioned approval.

[0134] (Exemplary Variation 2)

[0135] Further, in the exemplary embodiment, the case where a group name and budget information associated with the acquired license code are acquired, has been explained. For example, the selection system **1** may identify the name of a group to which a device **20** belongs and budget information of the device **20**, without acquiring a license code.

[0136] The information storing unit **101** in exemplary variation 2 may, for example, store group information in which the device name of a device **20** and information regarding a group to which the device **20** belongs (for example, the group name, group type, group size, and the like) are associated with each other, and the device selecting part **105** in exemplary variation 2 may select, based on information of a group name and the like associated with the device name of the device information, a different device **20** that is different from the device **20** regarding a candidate to be replaced. Further, the information storing unit **101** in exemplary variation 2 may store information of the budget of a user, and the budget information acquiring part **108** in exemplary variation 2 may acquire the information of the budget stored in the information storing unit **101**.

[0137] As describe above, the selection system **1** according to exemplary variation 2 identifies the name of a group to which a device **20** belongs and information of the budget, without acquiring a license code, and selects a device **20** to be replaced and/or a component to be replaced, and replacement products/a replacement product.

[0138] (Exemplary Variation 3)

[0139] Further, in the exemplary embodiment, the case where when the body or a specific part (for example, a CPU or the like) is selected as a candidate to be replaced, the product candidate selecting part **106** selects a product (product candidate) which matches or is similar to the body or a part of a different device **20** that is different from the device **20** regarding the candidate, has been explained. The product candidate selecting part **106** may, for example, select, from product information, a product candidate that has a performance higher than the body or the specific part, such as a CPU, of the device **20** to be replaced, without selecting a different device **20**.

[0140] (Exemplary Variation 4)

[0141] Furthermore, for example, the candidate-to-be-replaced selecting unit **103** may select, from among components of the devices **20**, a consumable or wear item (for example, printing paper, toner, a buttery, a CPU fan, or the like) as a candidate to be replaced. In this case, the product selecting unit **104** may select the same product (or a product of the same model) as the selected candidate to be replaced.

[0142] The foregoing description of the exemplary embodiments of the present invention has been provided for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Obviously, many modifications and variations will be apparent to practitioners skilled in the art. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, thereby enabling others skilled in the art to understand the invention for various embodiments and with the various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the following claims and their equivalents.

What is claimed is:

1. A selection system comprising:

an acquiring unit that acquires device information of a plurality of devices;

a candidate selecting unit that selects, from among the plurality of devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced; and

a product selecting unit that selects, based on a selection result by the candidate selecting unit and product information regarding a plurality of products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

2. A selection system comprising:

an acquiring unit that acquires device information indicating usage statuses of a plurality of components of devices;

a candidate selecting unit that selects, in a case where a component whose usage status does not meet a prede-

termined criterion exists, a candidate for a component to be replaced, from among the plurality of components; and

a product selecting unit that selects, based on a selection result by the candidate selecting unit and product information regarding a plurality of products, a component to be replaced, from among candidates selected, and a replacement product with which the component is to be replaced.

3. The selection system according to claim **1**,

wherein the product information includes information regarding prices of the individual products,

wherein the product selecting unit includes a budget information acquiring part that acquires information of a budget of a user, and a replacement product selecting part that selects the replacement product with which the selected candidate is to be replaced, and

wherein the product selecting unit makes a selection based on the acquired information of the budget of the user and the information regarding the price of the selected product.

4. The selection system according to claim **2**,

wherein the product information includes information regarding prices of the individual products,

wherein the product selecting unit includes a budget information acquiring part that acquires information of a budget of a user, and a replacement product selecting part that selects the replacement product with which the selected candidate is to be replaced, and

wherein the product selecting unit makes a selection based on the acquired information of the budget of the user and the information regarding the price of the selected product.

5. The selection system according to claim **1**,

wherein the product selecting unit includes an importance calculating part that calculates an importance regarding the selected candidate, based on the device information, and makes a selection based on the calculated importance.

6. The selection system according to claim **2**,

wherein the product selecting unit includes an importance calculating part that calculates an importance regarding the selected candidate, based on the device information, and makes a selection based on the calculated importance.

7. The selection system according to claim **1**, further comprising:

a selection server that is connected to the individual devices through a communication network,

wherein the selection server includes the acquiring unit, the candidate selecting unit, and the product selecting unit,

wherein each of the devices includes a device information generating unit that generates the device information, and a device information transmitting unit that transmits the generated device information to the selection server through the communication network, and

wherein the acquiring unit of the selection server acquires the device information through reception of the transmitted device information.

8. The selection system according to claim **2**, further comprising:

a selection server that is connected to the individual devices through a communication network,

wherein the selection server includes the acquiring unit, the candidate selecting unit, and the product selecting unit,

wherein each of the devices includes a device information generating unit that generates the device information, and a device information transmitting unit that transmits the generated device information to the selection server through the communication network, and

wherein the acquiring unit of the selection server acquires the device information through reception of the transmitted device information.

9. The selection system according to claim **1**,

wherein the product selecting unit makes a selection based on device information of a different device that is different from the device regarding the selected candidate, from among the plurality of devices.

10. The selection system according to claim **2**,

wherein the product selecting unit makes a selection based on device information of a different device that is different from the device regarding the selected candidate, from among the plurality of devices.

11. The selection system according to claim **9**,

wherein the device information includes information regarding purposes of the devices, and

wherein the product selecting unit makes a selection based on device information of a different device whose purpose matches or is similar to a purpose of the device regarding the selected candidate.

12. The selection system according to claim **10**,

wherein the device information includes information regarding purposes of the devices, and

wherein the product selecting unit makes a selection based on device information of a different device whose purpose matches or is similar to a purpose of the device regarding the selected candidate.

13. The selection system according to claim **1**,

wherein each of the devices belongs to a corresponding one of a plurality of groups, and

wherein the product selecting unit makes a selection based on a group to which the device regarding the selected candidate belongs, from among the plurality of devices.

14. The selection system according to claim **2**,

wherein each of the devices belongs to a corresponding one of a plurality of groups, and

wherein the product selecting unit makes a selection based on a group to which the device regarding the selected candidate belongs, from among the plurality of devices.

15. A selection server comprising:

an acquiring unit that acquires device information of a plurality of devices;

a candidate selecting unit that selects, from among the plurality of devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced; and

a product selecting unit that selects, based on a selection result by the candidate selecting unit and product information regarding a plurality of products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

16. A selection server comprising:

an acquiring unit that acquires device information indicating usage statuses of a plurality of components of devices;

a candidate selecting unit that selects, in a case where a component whose usage status does not meet a predetermined criterion exists, a candidate for a component to be replaced, from among the plurality of components; and

a product selecting unit that selects, based on a selection result by the candidate selecting unit and product information regarding a plurality of products, a component to be replaced, from among candidates selected, and a replacement product with which the component is to be replaced.

17. A selection method comprising:

acquiring device information of a plurality of devices;

selecting, from among the plurality of devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced; and

selecting, based on a selection result and product information regarding a plurality of products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

18. A selection method comprising:

acquiring device information indicating usage statuses of a plurality of components of devices;

selecting, in a case where a component whose usage status does not meet a predetermined criterion exists, a candidate for a component to be replaced, from among the plurality of components; and

selecting, based on a selection result and product information regarding a plurality of products, a component to be replaced, from among candidates selected, and a replacement product with which the component is to be replaced.

19. A non-transitory computer readable medium storing a program causing a computer to execute a process for selection, the process comprising:

acquiring device information of a plurality of devices;

selecting, from among the plurality of devices, a device whose device information does not meet a predetermined criterion, as a candidate for a device to be replaced; and

selecting, based on a selection result and product information regarding a plurality of products that meet the predetermined criterion, a device to be replaced, from among candidates selected, and a replacement product with which the device is to be replaced.

20. A non-transitory computer readable medium storing a program causing a computer to execute a process for selection, the process comprising:

acquiring device information indicating usage statuses of a plurality of components of devices;

selecting, in a case where a component whose usage status does not meet a predetermined criterion exists, a candidate for a component to be replaced, from among the plurality of components; and

selecting, based on a selection result and product information regarding a plurality of products, a component to be replaced, from among candidates selected, and a replacement product with which the component is to be replaced.

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